



Million Hearts™ and the Kentucky Initiative

Alison L. Bailey, MD
Gill Heart Institute
University of Kentucky



Objectives

- Discuss the prevalence of Cardiovascular disease and risk factors in Kentucky
- Describe the Million Hearts™ initiative and ways to implement risk reduction in Kentucky





Million Hearts™

Preventing 1 million heart attacks
and strokes in 5 years

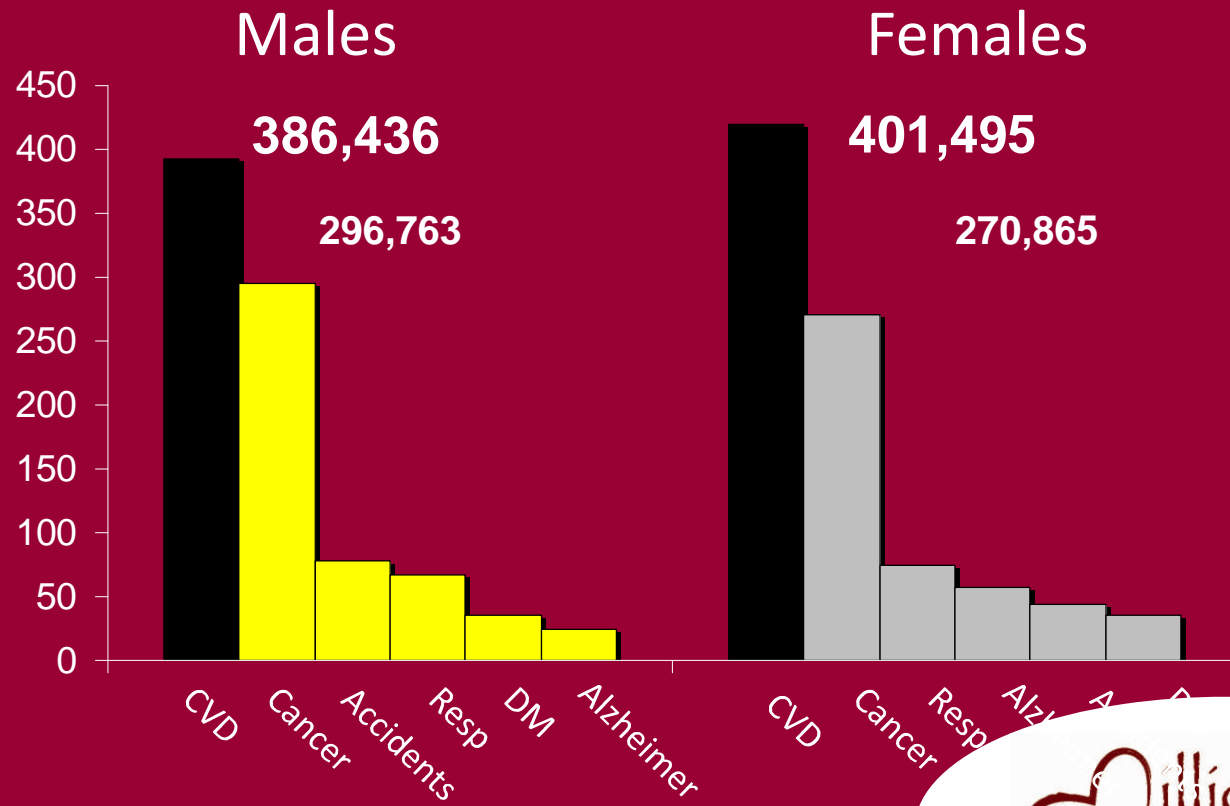


Heart Disease and Strokes are Leading Killers in the U.S.

- Cause 1 of every 3 deaths
- Over 2 million heart attacks and strokes each year
 - 800,000 deaths
 - Leading cause of preventable death in people < 65
 - \$444 B in health care costs, lost productivity
 - Treatment accounts for ~ \$1 of every \$6 spent
- Greatest expression of racial disparities in life expectancy



Leading Causes of Death in the US

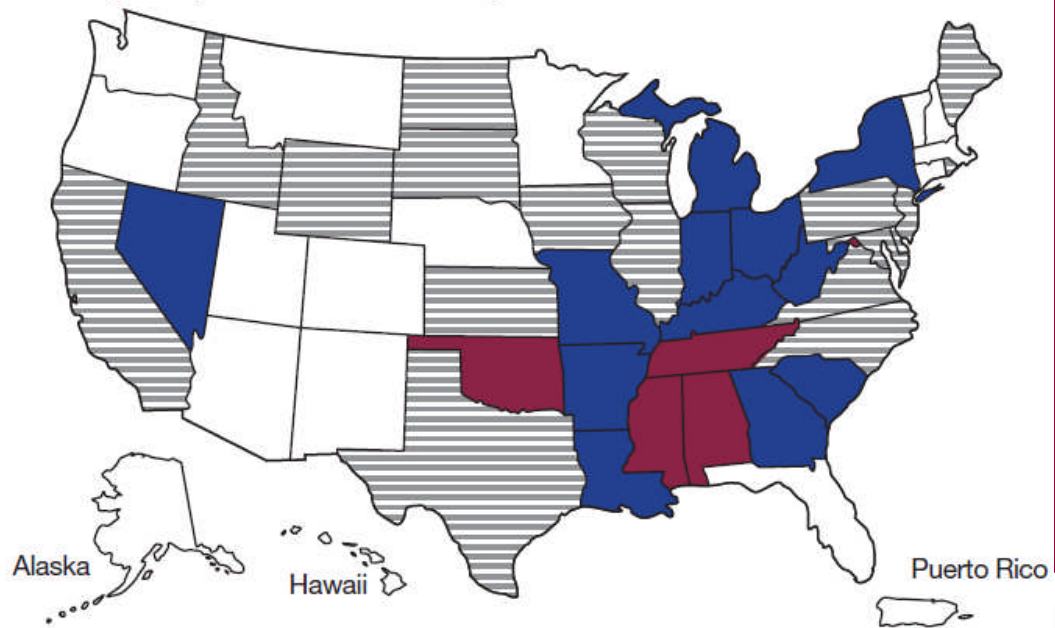
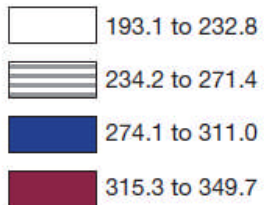


Go AS. *Circulation* 2012

Deaths from Cardiovascular Disease

Major Cardiovascular Disease Age-Adjusted Death Rates by State

Death Rates Per
100,000 Population

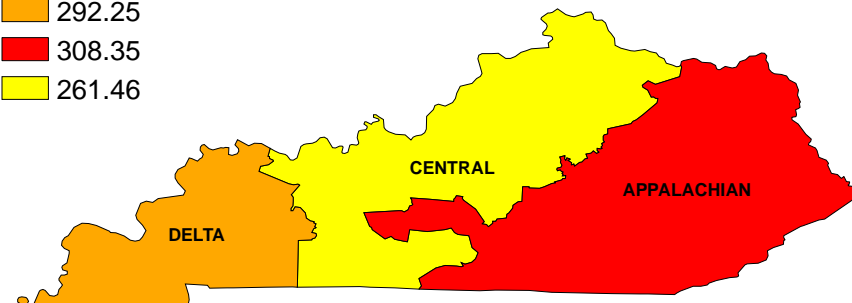
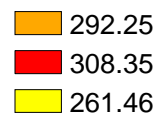


Roger VL. *Circulation* 2012

Regional Differences in Heart Disease

Deaths from Heart Disease

Age-Adjusted Mortality Rate Per 100,000 Total Population, 2000-2004



Source: CDC Wonders Mortality Data, 2007
Prepared By: Ashley Bostic, July 2007

0 45 90 180 Miles

UK COOPERATIVE EXTENSION SERVICE
University of Kentucky – College of Agriculture

KSU COOPERATIVE EXTENSION PROGRAMS
Kentucky State University

The development of the HEEL program was made possible by Senator Mitch McConnell with funds earmarked for the University of Kentucky, College of Agriculture, Lexington, KY and budgeted through the CSREES/USDA Federal Administration.





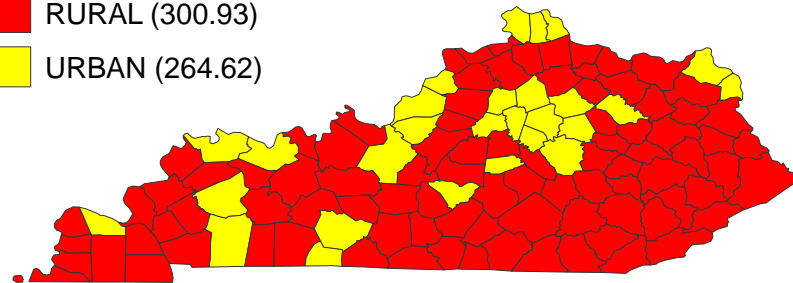
<http://www.ca.uky.edu/HES/FCS/heel/heel/pdf/Updated/Heart.pdf>

Regional Differences in Heart Disease

Deaths from Heart Disease

Age-Adjusted Mortality Rate Per 100,000 total Population, 2000-2004

-  RURAL (300.93)
-  URBAN (264.62)



Source: CDC Wonder, 2000-2004
Prepared By: Ashley Bostic, July 2007

0 45 90 180 Miles

UK COOPERATIVE EXTENSION SERVICE
University of Kentucky – College of Agriculture

KSU COOPERATIVE EXTENSION PROGRAM
Kentucky State University – Land Grant Program

The development of the HEEL program was made possible by Senator Mitch McConnell with funds earmarked for the University of Kentucky, College of Agriculture, Lexington, KY and budgeted through the CSREES/USDA Federal Administration.



<http://www.ca.uky.edu/HES/FCS/heel/heel/pdf/Urban/heart.pdf>

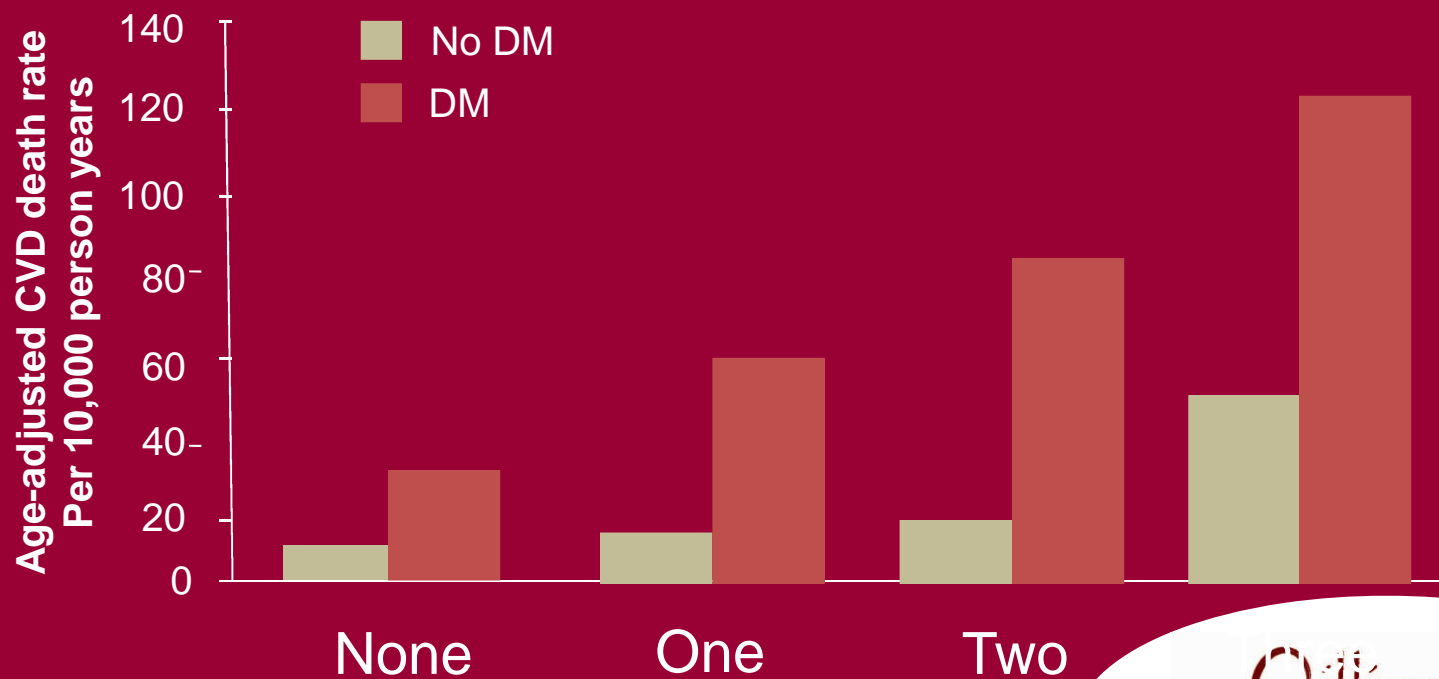
What are the Risk Factors?

- Age
- Family History (<55 for ♂ and <65 for ♀)
- Diabetes
- Dyslipidemia
- Hypertension
- Overweight & Obesity
- Physical Inactivity
- Tobacco Use
- Psychosocial distress



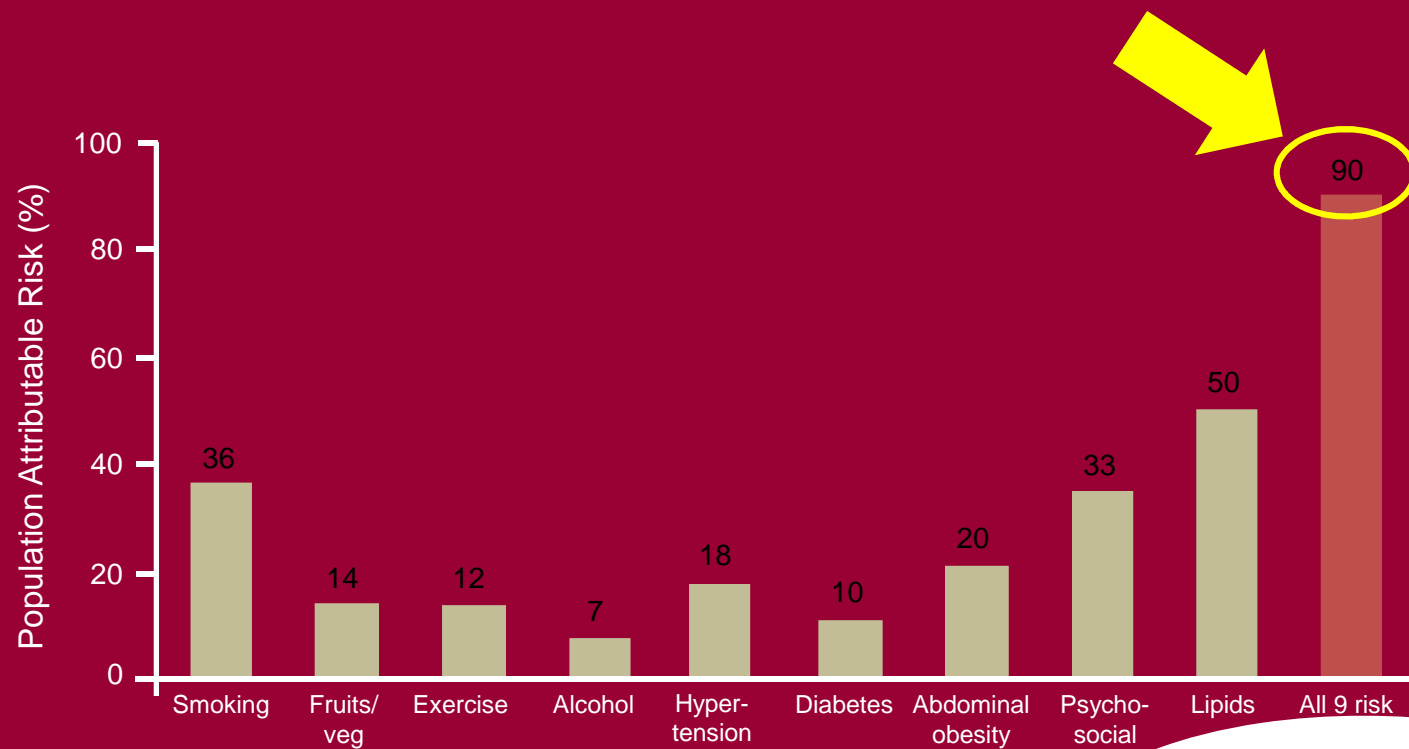
More Risk Factors = More Disease

Additive Effects of HTN, HL, and Smoking



Stamler, *Diabetes Care*, 1993

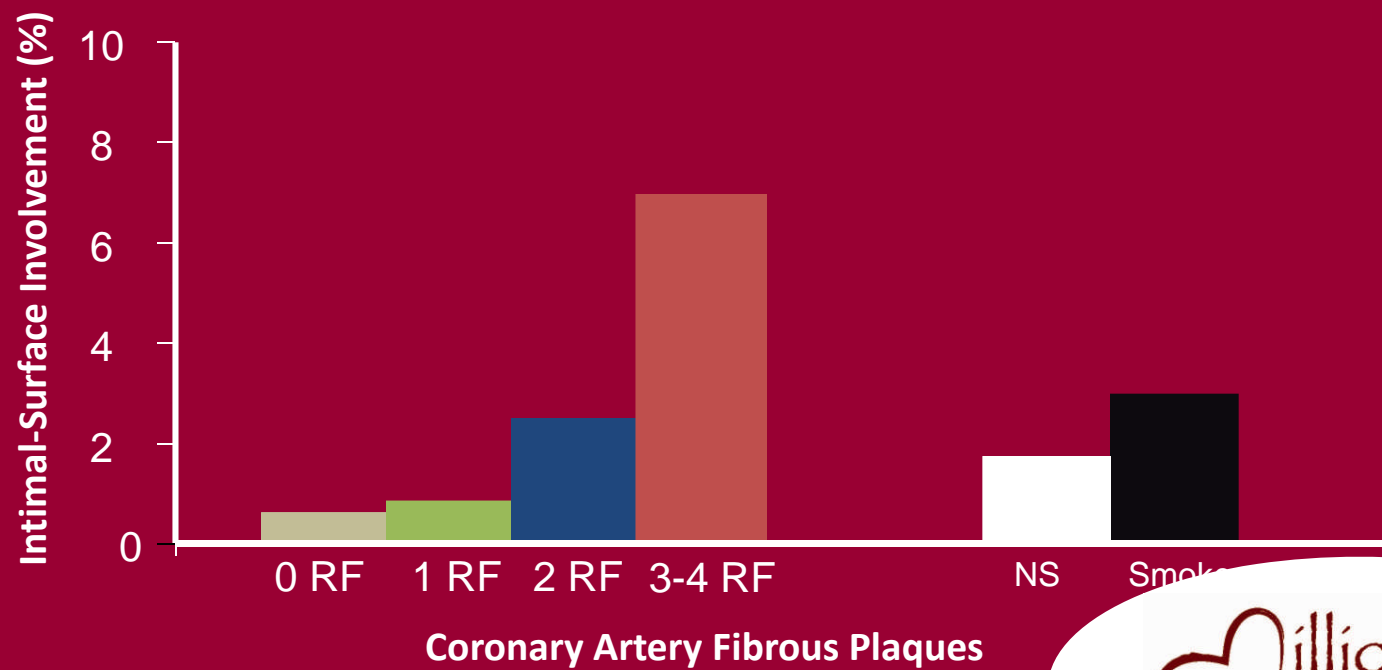
INTERHEART: Risk factors Predict first MI



Yusuf S; Lancet; 2004

Prevalence of Atherosclerosis in Young Adults

The Bogalusa Heart Study



Berenson G, *NEJM*, 1998

What is *Ideal Cardiovascular Health*?

■ Optimal health behaviors

- No tobacco use
- BMI < 25 kg/m²
- Moderate physical activity ≥150 min/week or vigorous physical activity ≥75 mins/week
- Healthy diet



Lloyd-Jones D, *Circulation*, 2010

What is *Ideal Cardiovascular Health*?

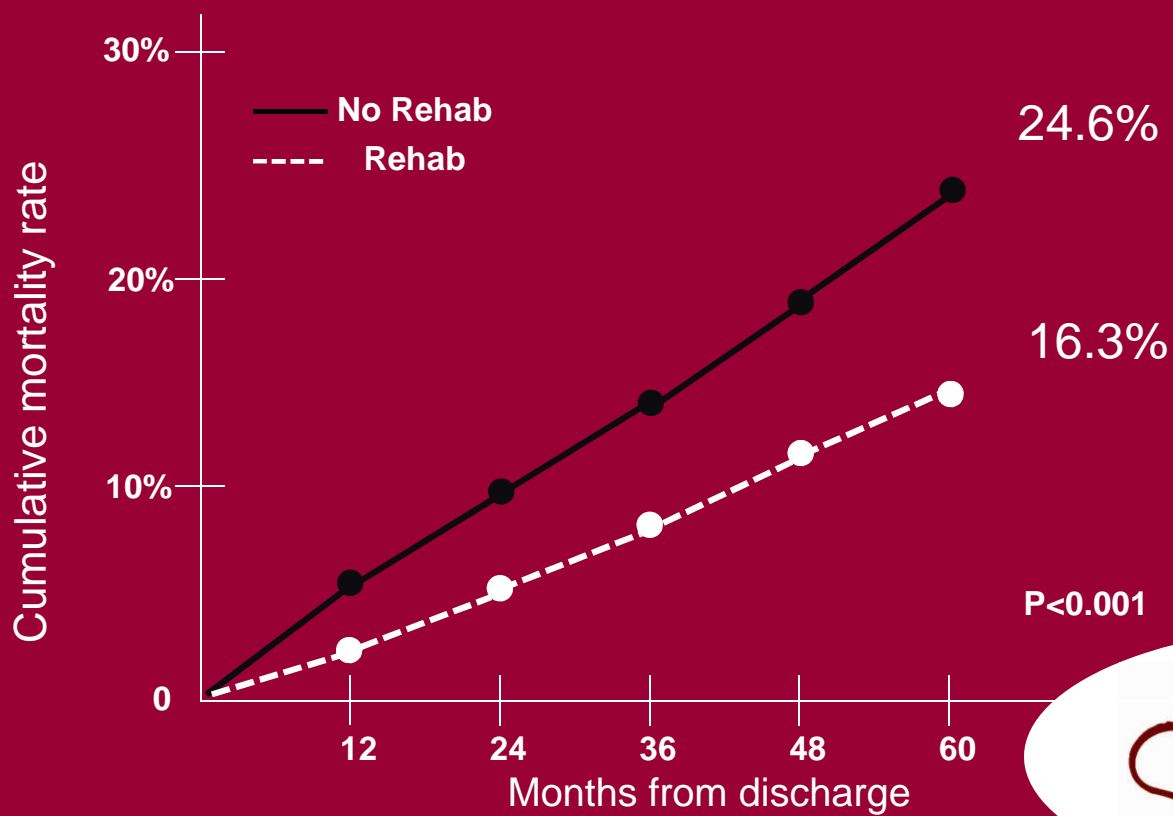
- **Optimal health factors**
 - Total cholesterol <200 mg/dL
 - Blood pressure <120/80 mmHg
 - Fasting glucose <100 mg/dL
 - No tobacco use



Lloyd-Jones D, *Circulation*, 2010

Cardiac Rehab in Medicare Beneficiaries

Survival in the Participants and Non-participants of Cardiac Rehab



Suaya, JACC, 2009



Healthy Lifestyle Reduces Risk

- Men & women at age 50 years with all optimal levels of health factors had:
 - ✓ ***Remaining lifetime risk for CVD of about 5%*** whereas those with ≥ 2 major risk factors had remaining lifetime risks of 50% in women and 69% for men
 - ✓ ***A median survival of >40 years*** compared with 28-31 years among those with ≥ 2 major risk factors

Lloyd-Jones D, *Circulation*, 2010



Individualizing an Intervention

- Effective lifestyle interventions must take into account the unique cultural and societal needs of individuals being targeted to be effective.



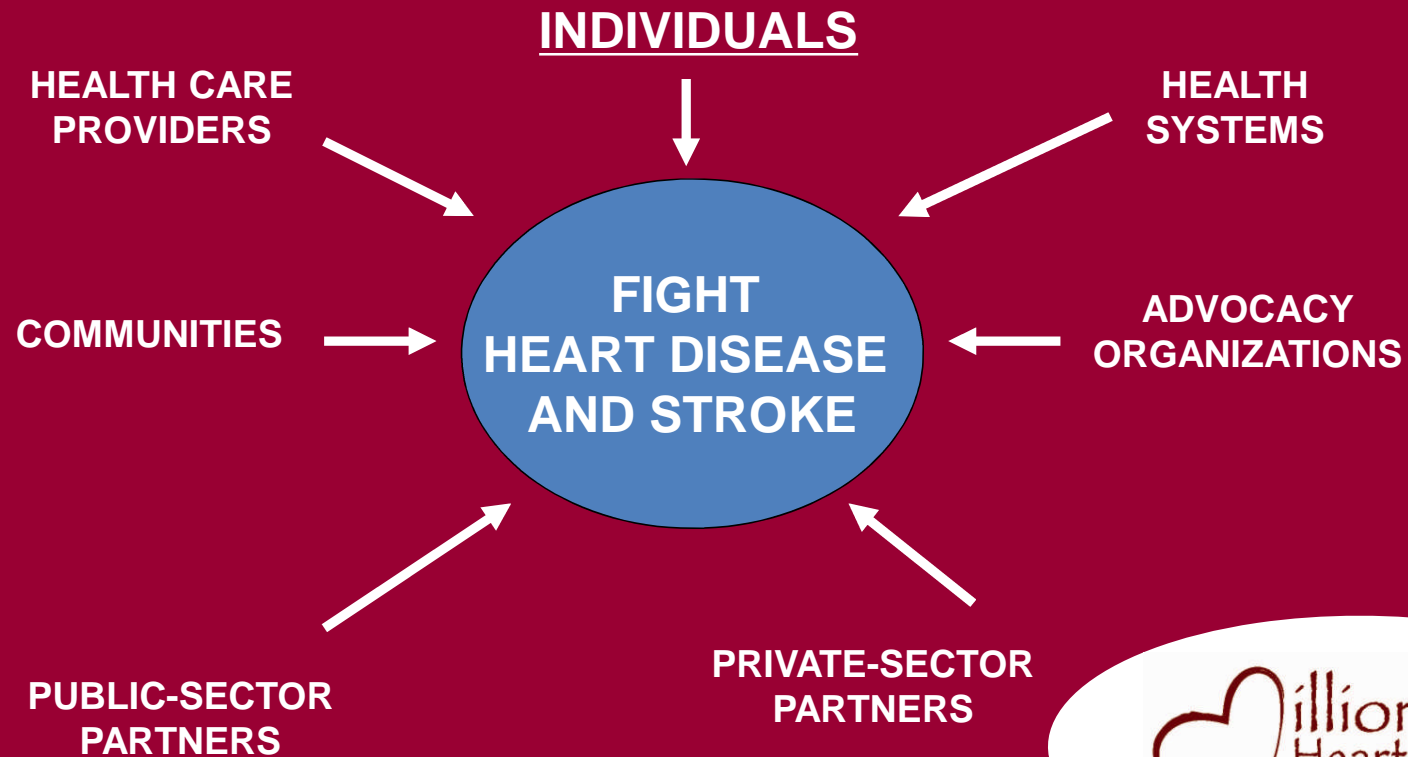
Million Hearts™

FACTS

- National health initiative
- Launched by the US Department of Health and Human Services
- September 2011
- Prevent 1 million heart attacks and strokes in 5 years



MILLION HEARTS™



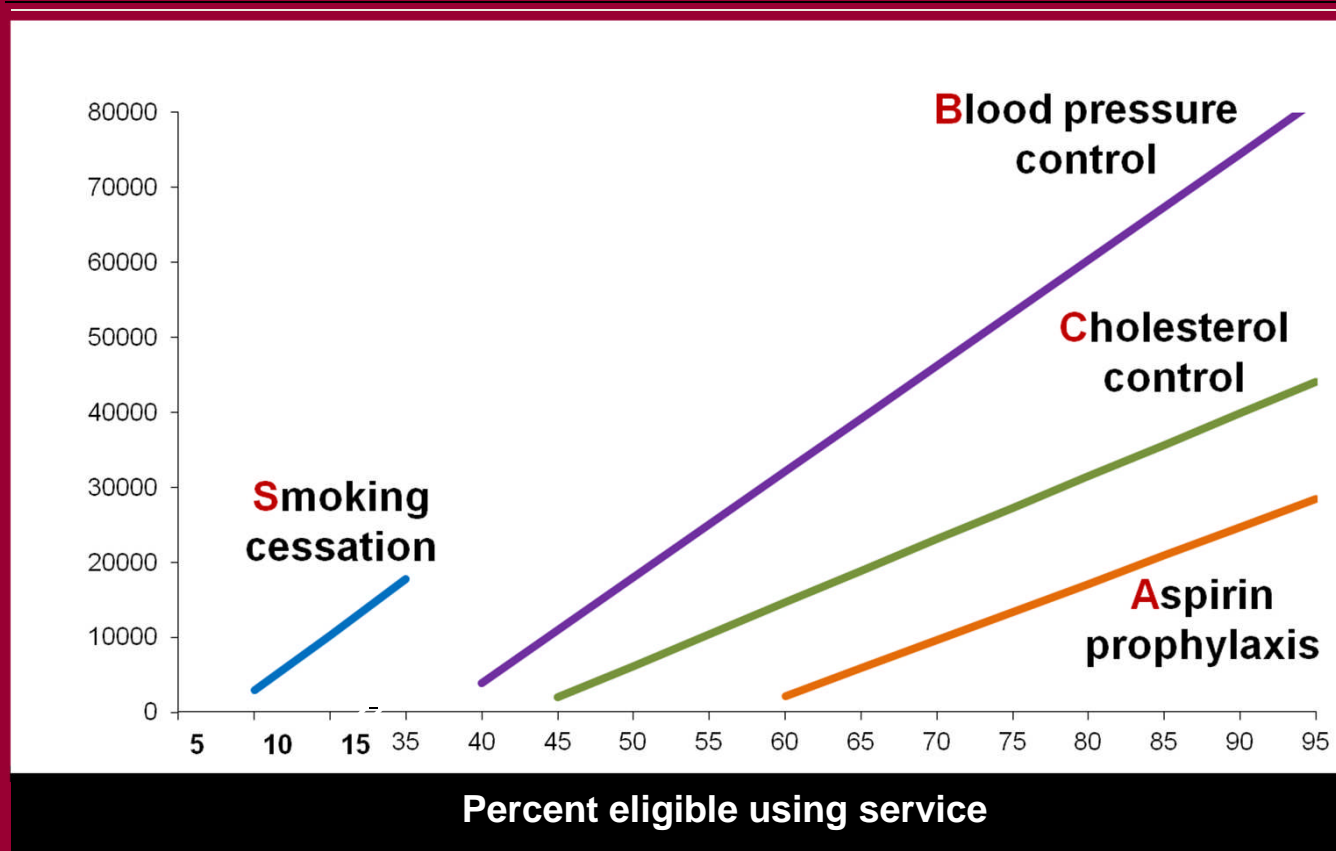
Status of the ABCS

A spirin	People at increased risk of cardiovascular disease who are taking aspirin	47%
B lood pressure	People with hypertension who have adequately controlled blood pressure	46%
C holesterol	People with high cholesterol who have adequately managed hyperlipidemia	33%
S moking	People trying to quit smoking who get help	23%

Source: MMWR: Million Hearts: Strategies to Reduce the Prevalence of Leading Cardiovascular Disease Risk Factors --- United States, 2011, Early Release, Vol. 60



Improved Cardiovascular Care Could Save 100,000 Lives/Year



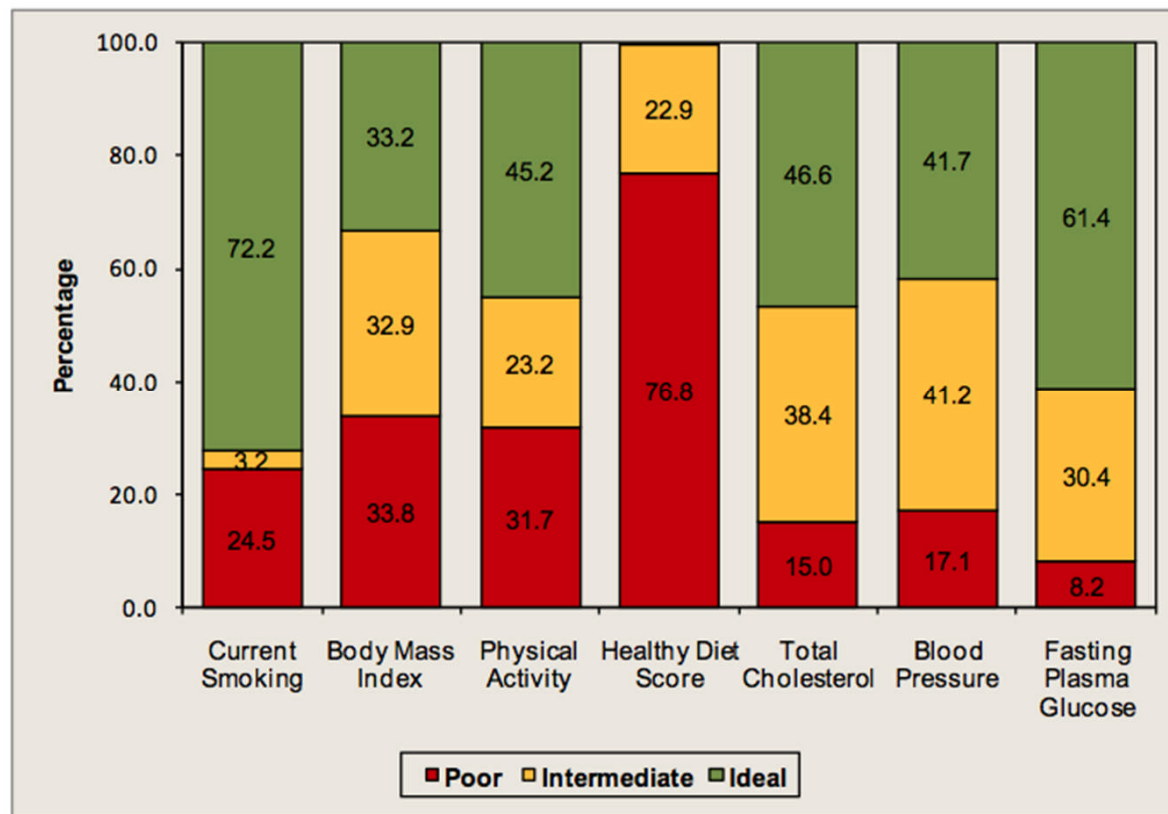
Source: Farley TA, et al. Am J Prev Med 2010;38:600-9.

Prevalence of Risk Factors in Kentucky

- Data from the 2003 Behavioral Risk Factor Surveillance System survey reveal that **Kentucky had the highest prevalence of multiple risk factors for heart disease in adults (46.2%) among the fifty states**
- The surveyed risk factors were : high blood pressure, high cholesterol, diabetes, current smoking, physical inactivity, and obesity



Prevalence for CV Health Factors in U.S. Adults



Rogers V, Circulation, 2010

Status of the ABCS

A spirin	People at increased risk of cardiovascular disease who are taking aspirin	47%
B lood pressure	People with hypertension who have adequately controlled blood pressure	46%
C holesterol	People with high cholesterol who have adequately managed hyperlipidemia	33%
S moking	People trying to quit smoking who get help	23%

Source: MMWR: Million Hearts: Strategies to Reduce the Prevalence of Leading Cardiovascular Disease Risk Factors --- United States, 2011, Early Release, Vol. 60



Aspirin

- In 2007, the United States Agency for Healthcare Research and Quality reported that 19 % of Americans regularly took aspirin, including 27% of those ages 45 to 64 and about 50% of those >65
- >50 million people in the US
- Most frequently used drug in the world



Aspirin Therapy Benefits

- The U.S. Preventive Services Task Force (USPSTF) found good evidence that aspirin *decreases the incidence of myocardial infarction in men and ischemic strokes in women....*



Aspirin Therapy Benefits

- However... the USPSTF also found good evidence that *aspirin increases the incidence of gastrointestinal bleeding and fair evidence that aspirin increases the incidence of hemorrhagic stroke.*



Aspirin Therapy Benefits

- The benefits of aspirin therapy depend substantially on an individual's risk of cardiovascular disease or stroke and adverse treatment effects.



Aspirin for Primary Prevention

- * The USPSTF recommends
 - * aspirin for women age 55 to 79 years when the potential benefit of a reduction in ischemic strokes outweighs the potential harm of an increase in GI hemorrhage
 - * aspirin for men age 45 to 79 years when the benefit of a reduction in MI outweighs the potential harm of bleeding
 - * No change in mortality
- * Do not recommend >80 years of age
- * Recommend AGAINST the use of aspirin for stroke prevention in women <55 years of age
- * Optimal dose not known (likely 75 mg/day)

* T



Aspirin for Primary Prevention

Women

- * ACC/AHA recommends stratifying based on FRS and offering therapy to women with >20% risk or in a high-risk group
- * >65 years if BP is controlled and benefit for ischemic stroke and MI prevention outweigh the risk of GI hemorrhage
- * <65 years if ischemic stroke prevention is likely to outweigh the risks
- * Do not recommend for healthy women <65 years of age

6 T



Mosca L, JACC, 2007

Aspirin for Primary Prevention

Men

- * AHA recommends stratifying based on FRS and offering therapy to persons with >10% risk or in a high-risk group

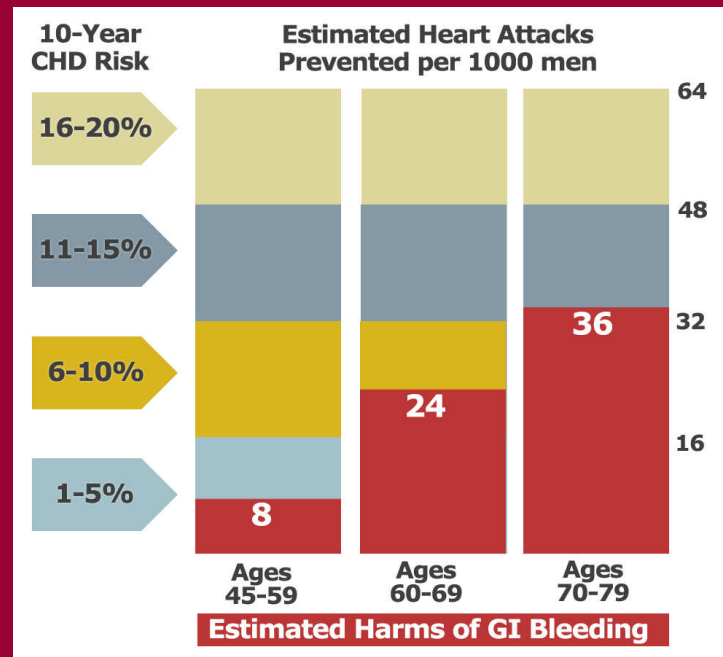
• T



Pearson , Circulation, 2002

Aspirin Therapy Weighing Benefits

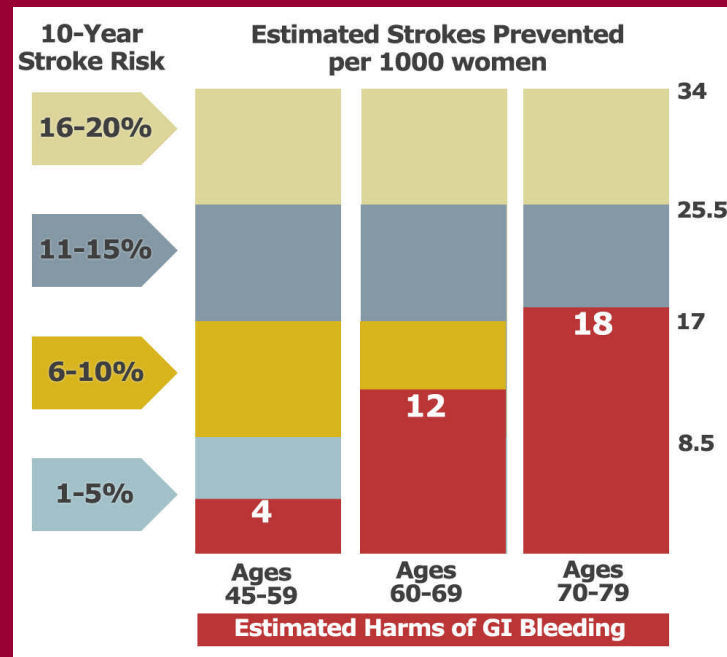
- Estimated heart attacks
- prevented and estimated
- harms of using aspirin for
- 10 years in a hypothetical
- cohort of 1000 men aged
- 45-79 years.



(Source: <http://www.uspreventiveservicetaskforce.org/uspsf09/aspirincvd.asp?cvid=12.htm>)

Aspirin Therapy Weighing Benefits

Estimated number of strokes prevented according to the stroke risk level in women aged 45 to 79 years.



(Source: <http://www.uspreventiveservicestaskforce.org/uspstf09/aspirin/cvd/aspcvdra4.htm>)

Aspirin

- Side effects are dose dependent but efficacy is not
- Enteric coating does not change risk of GI bleeding events

Campbell, NEJM, 2007



Aspirin Summary

- * For Acute events and secondary prevention, aspirin is associated with benefit
- * For primary prevention, the risk and benefits of aspirin use must be assessed on an individual basis and therapy recommended for those at highest risk of events and lowest risk of bleeding

* T



Lloyd-Jones D, Circulation, 2010

Status of the ABCS

A spirin	People at increased risk of cardiovascular disease who are taking aspirin	47%
B lood pressure	People with hypertension who have adequately controlled blood pressure	46%
C holesterol	People with high cholesterol who have adequately managed hyperlipidemia	33%
S moking	People trying to quit smoking who get help	23%

Source: MMWR: Million Hearts: Strategies to Reduce the Prevalence of Leading Cardiovascular Disease Risk Factors --- United States, 2011, Early Release, Vol. 60

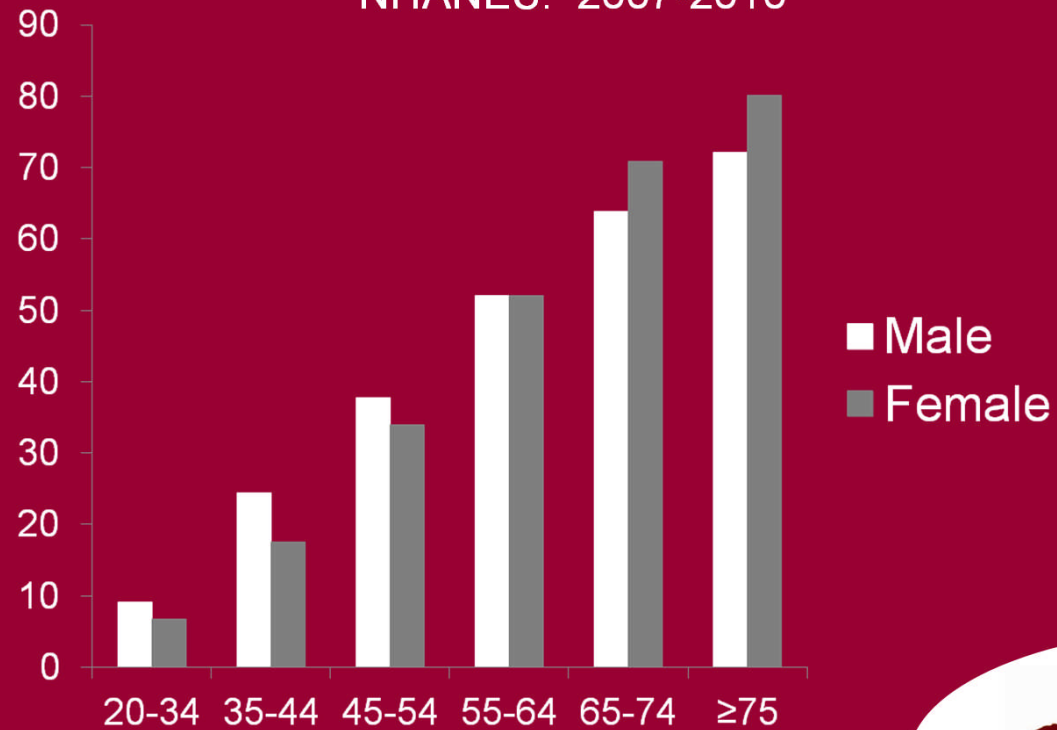


**Hypertension is a Significant Risk
Factor for CVD, the leading cause of
death for all Americans**



Prevalence of Hypertension

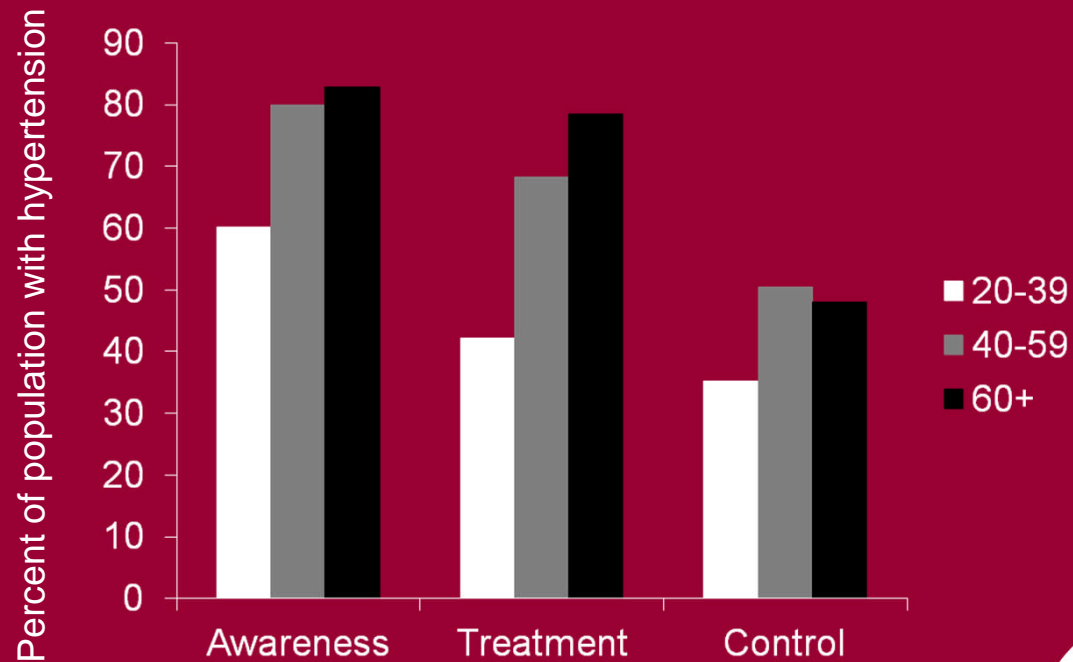
Adults ≥ 20 years of age
NHANES: 2007-2010



Go AS. *Circulation* 2012

Hypertension: Awareness, Treatment and Control

Adults ≥ 20 years of age
NHANES: 2005 - 2008



Roger VL. *Circulation* 2011

Prevalence of Hypertension in KY

- Adults who have been told they have high blood pressure: **38%**



Blood Pressure Classification

BP Classification	SBP mmHg		DBP mmHg
Optimal	<120	and	<80
Prehypertension	120–139	or	80–89
Stage 1 Hypertension	140–159	or	90–99
Stage 2 Hypertension	≥160	or	≥100



Chobanian AV (JNC 7), JAMA, 2003

Uncontrolled Blood Pressure Is Bad

1 Million Individuals, aged 40 to 69 years



Lewington S et al. *Lancet*. 2002

Goals of Therapy

- Reduce CVD and renal morbidity and mortality
- Treat to **BP <140/90 mmHg**
- or **BP <130/80 mmHg** in patients with **diabetes or chronic kidney disease**
- Achieve BP goal especially in persons ≥ 50 years of age



Benefits of Lowering BP

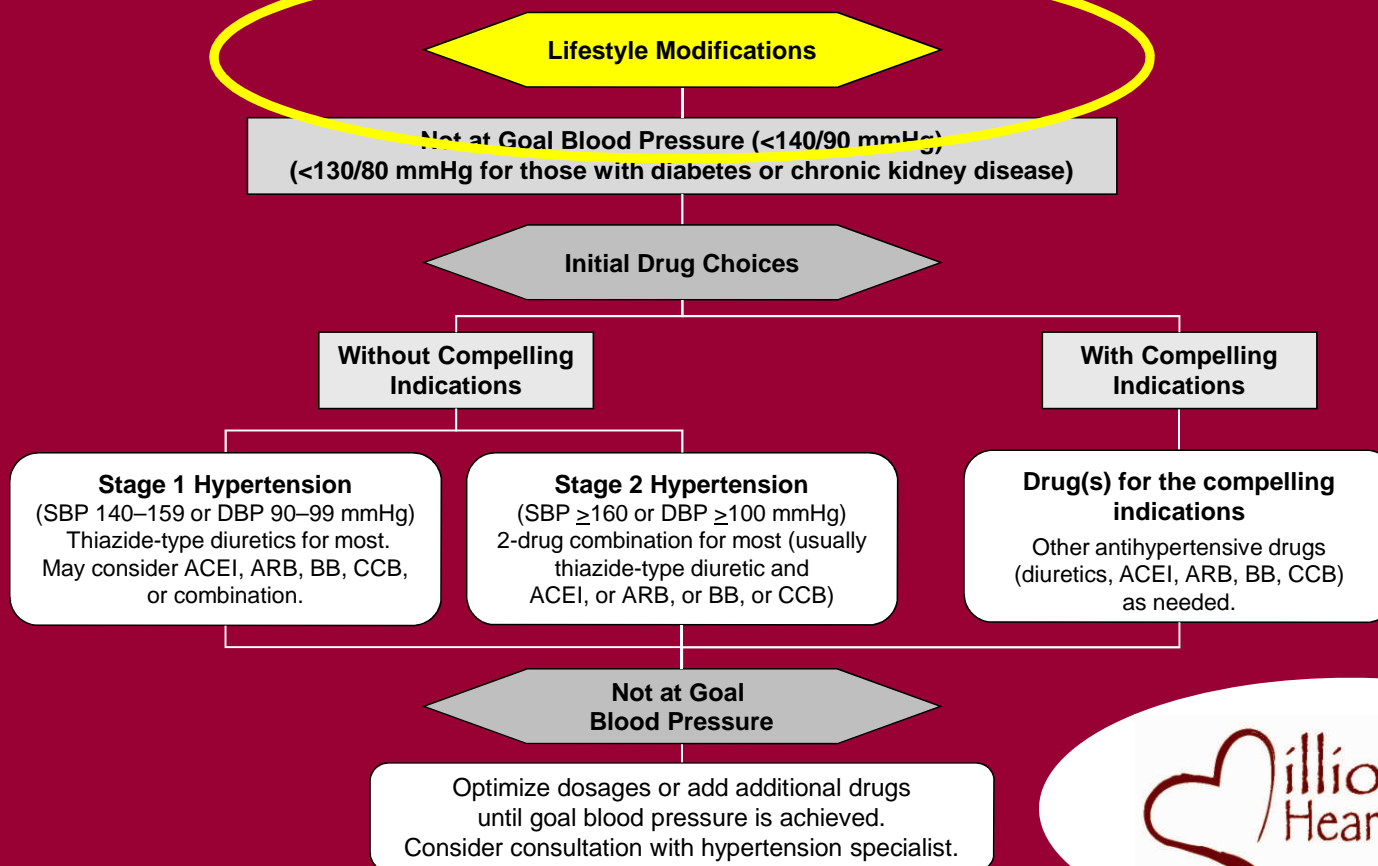
	Average Percent Reduction
Stroke incidence	35–40%
Myocardial infarction	20–25%
Heart failure	50%

In stage 1 HTN with additional CVD risk factors, achieving a sustained 12 mmHg reduction in SBP over 10 years will **prevent 1 death for every 11 patients treated.**



Chobanian AV (JNC 7), JAMA, 2003

Algorithm for Treatment of Hypertension



Chobanian AV (JNC 7), JAMA, 2003



Classification and Management of BP for adults

BP classification	SBP* mmHg	DBP* mmHg	Lifestyle modification	Initial drug therapy	
				Without compelling indication	With compelling indications
Normal	<120	and <80	Encourage		
Prehypertension	120–139	or 80–89	Yes	No antihypertensive drug indicated.	Drug(s) for compelling indications. ‡
Stage 1 Hypertension	140–159	or 90–99	Yes	Thiazide-type diuretics for most. May consider ACEI, ARB, BB, CCB, or combination.	Drug(s) for the compelling indications. ‡
Stage 2 Hypertension	≥160	or ≥100	Yes	Two-drug combination for most† (usually thiazide-type diuretic and ACEI or ARB or BB or CCB).	Other antihypertensive drugs (diuretics, ACEI, ARB, BB, CCB) as needed.



Lifestyle Modification

Modification	Approximate SBP reduction
DASH eating plan	8–14 mmHg
Sodium reduction	2–8 mmHg
Weight reduction	5–20 mmHg/10 kg weight loss
Physical activity	4–9 mmHg
Moderation of alcohol	2–4 mmHg



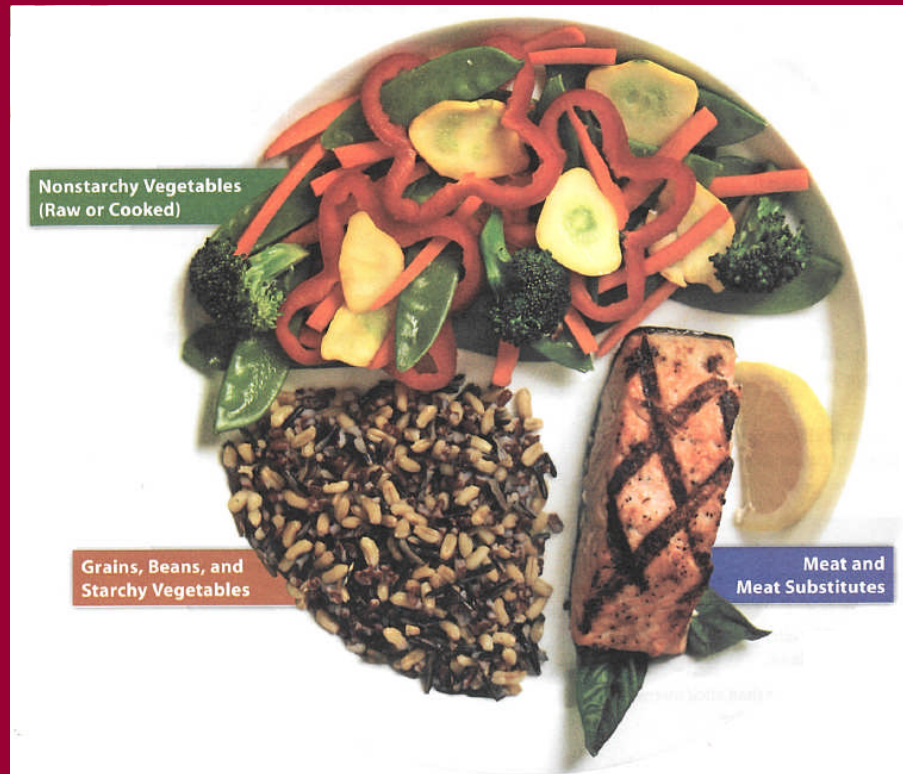
Chobanian AV (JNC 7), JAMA, 2003

DASH Diet

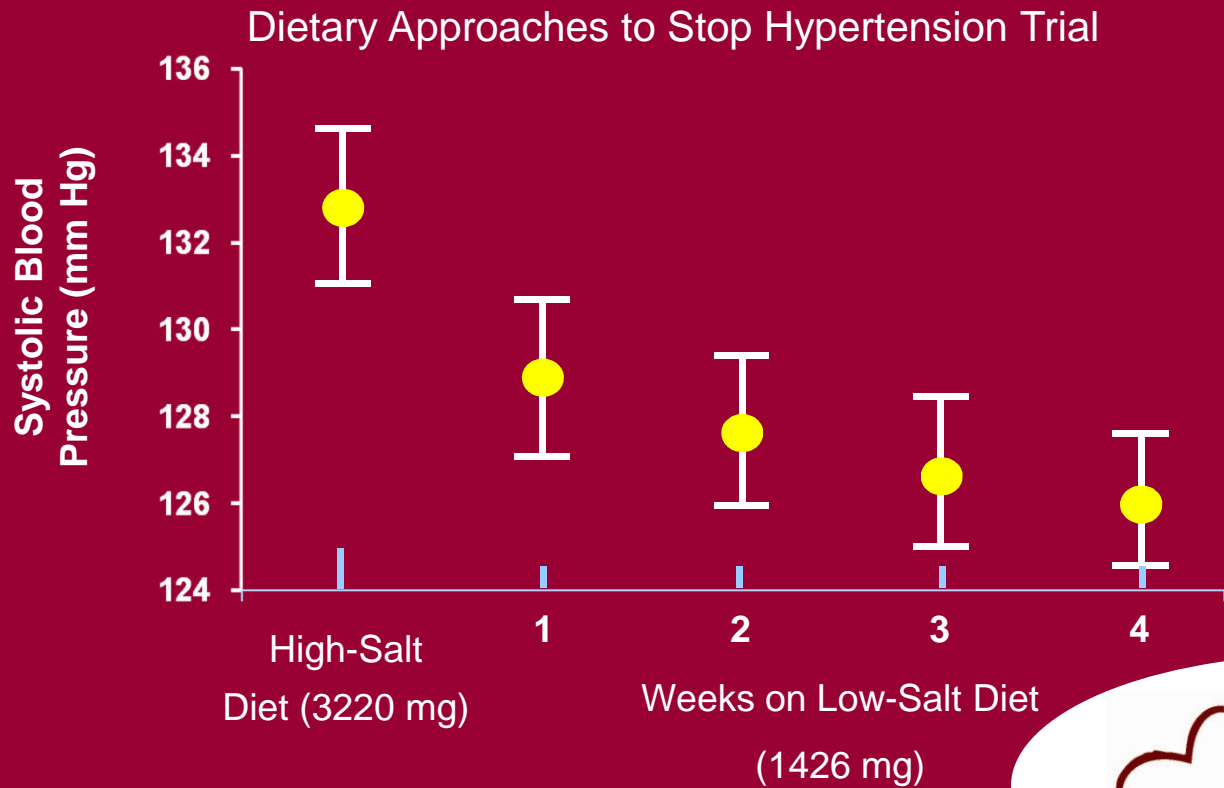
- <2300 mg day Sodium or less;
<1500 mg is better!!
- Lots of vegetables, fruits and whole grains
- Low-fat or fat-free dairy products
- Low in saturated and trans fat



DASH-type Diet



Linear Association between Sodium Intake and BP



Obarzanek E, Hypertension, 2003



Lifestyle Modification is Important

Diet lowers blood pressure as much as drugs do

TREATMENT	REDUCTION (MM HG)
Hydrochlorothiazide (thiazide diuretic)*	11/5
Atenolol (beta-blocker)*	8/7
Captopril (angiotensin-converting enzyme inhibitor)*	6/5
Diltiazem (calcium channel blocker)*	10/9
Prazosin (alpha-1 blocker)*	9/6
DASH plus 1,500 mg sodium diet†	11/6

*When given as monotherapy to men with stage 1 hypertension in the Veterans Affairs Cooperative study²¹

†When applied to men and women with stage 1 hypertension in the Dietary Approaches to Stop Hypertension (DASH)-Sodium study^{2,19}; see text and TABLE 1 for a description of the DASH diet



Lifestyle Modification

Modification	Approximate SBP reduction
DASH eating plan	8–14 mmHg
Sodium reduction	2–8 mmHg
Weight reduction	5–20 mmHg/10 kg weight loss
Physical activity	4–9 mmHg
Moderation of alcohol	2–4 mmHg



Chobanian AV (JNC 7), JAMA, 2003

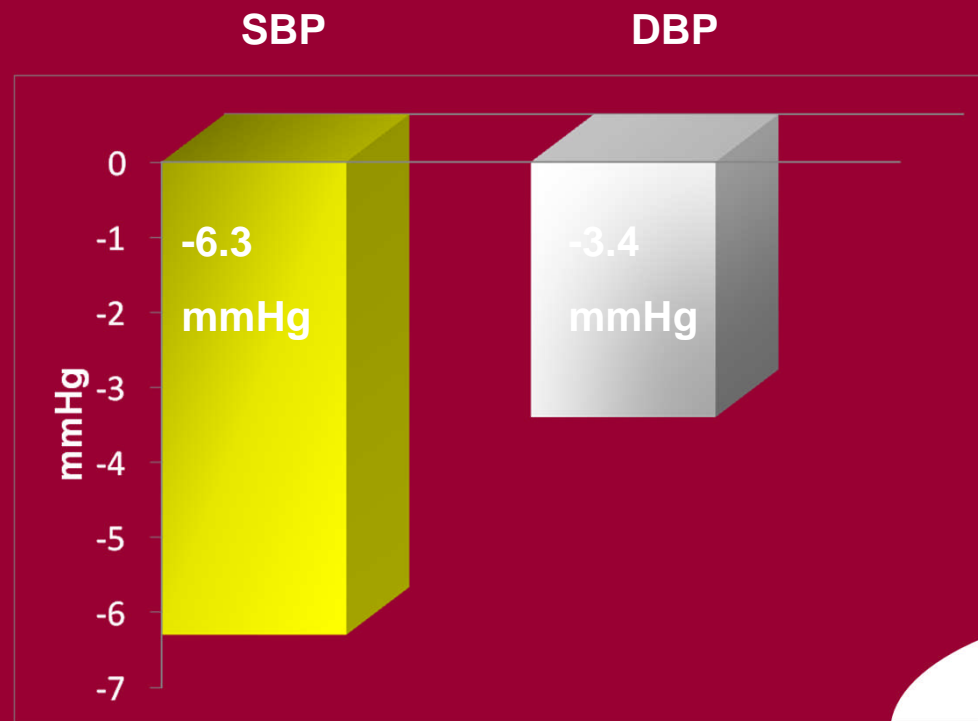
Prevalence of Obesity in KY

- Adults who are overweight: 36%
- Adults who are obese: 30%



Blood Pressure Improves with Weight Loss

Average weight loss of 4.1 kg



Horvath, K., Arch Intern Med, 2008

Lifestyle Modification

Modification	Approximate SBP reduction
DASH eating plan	8–14 mmHg
Sodium reduction	2–8 mmHg
Weight reduction	5–20 mmHg/10 kg weight loss
Physical activity	4–9 mmHg
Moderation of alcohol	2–4 mmHg



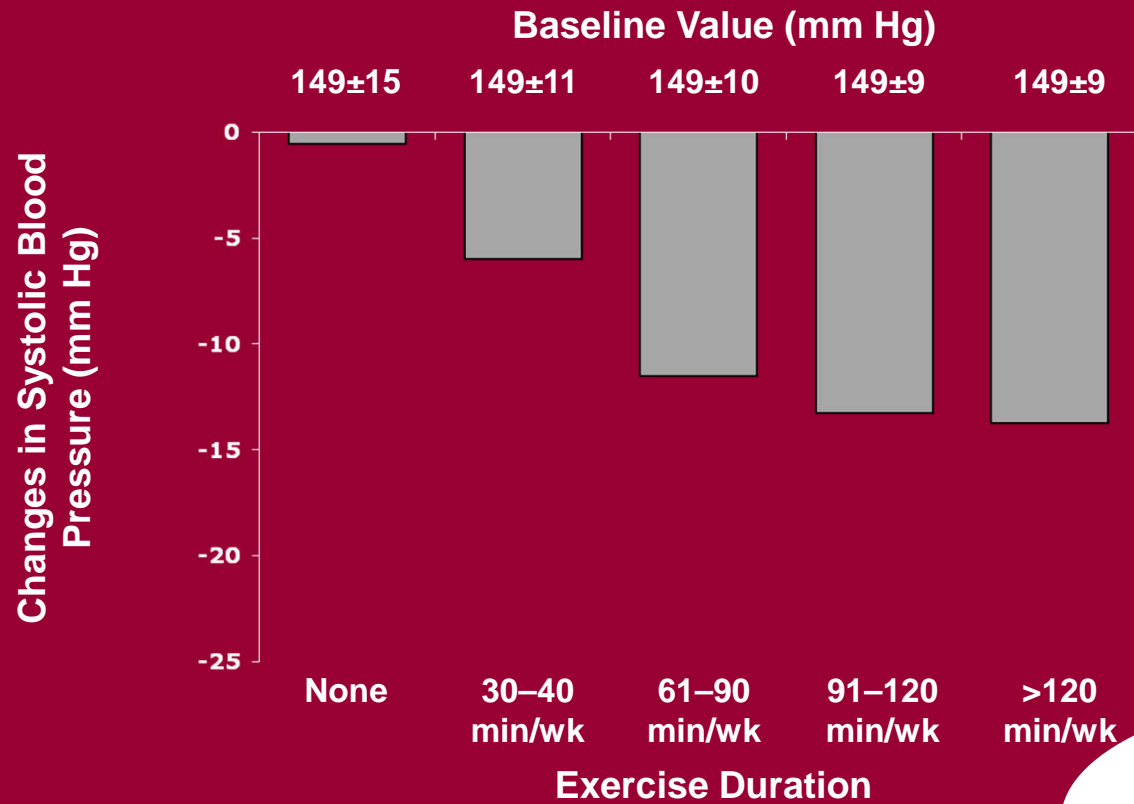
Chobanian AV (JNC 7), JAMA, 2003

Activity in KY

- Adults who participated in >150 minutes of physical activity per week: **48%**



Aerobic Exercise Can Lower Systolic Blood Pressure



Ishikawa-Takata K., Am J Hypertens. 2003

Combining Lifestyle Modifications Can Have Additive Effects

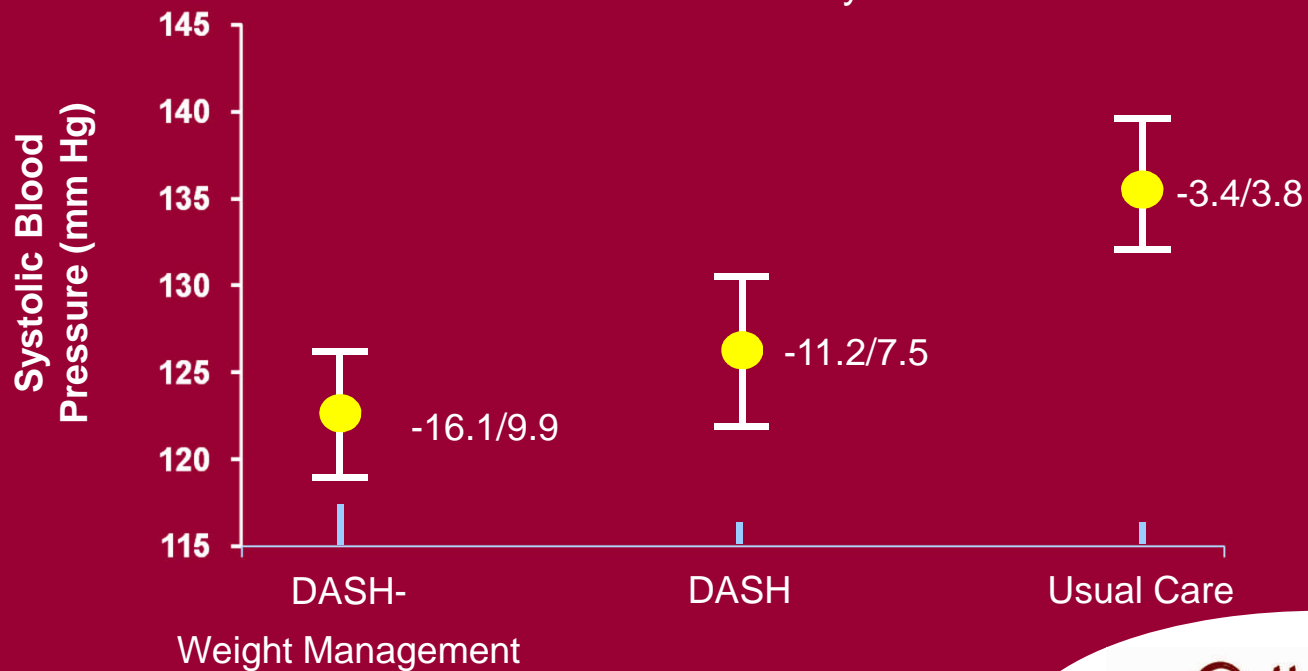
Study Group	Change in Systolic BP	Change in Diastolic BP
Control (n=22)	−0.9 mm Hg	−1.4 mm Hg
Exercise Only (n=44)	−4.4 mm Hg	−4.3 mm Hg
Weight Loss and Exercise (n=46)	−7.4 mm Hg	−5.6 mm Hg



Blumenthal JA, Arch Intern Med, 2000

Additive Effect with DASH + Weight Loss

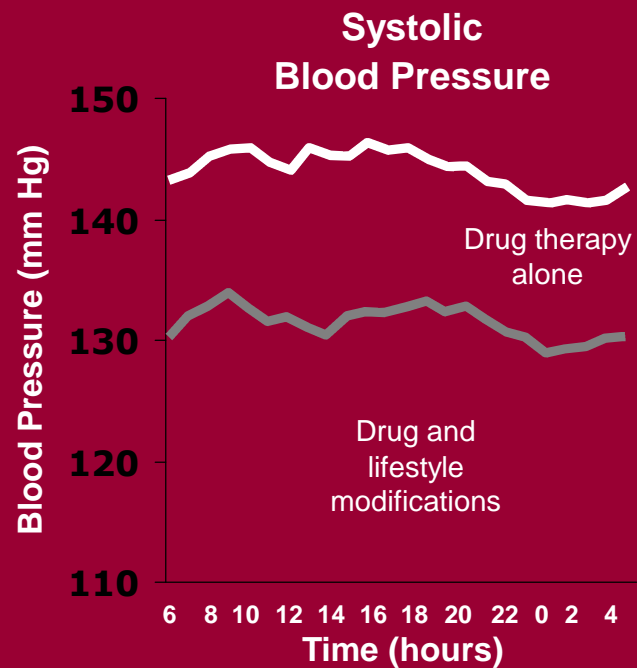
The ENCORE Study



Blumenthal J, Arch Int Med 2010

Antihypertensive Medication Is Augmented by Lifestyle Modifications

Diet-Exercise-Weight Loss Intervention Trial



Miller ER, Hypertension, 2002

Lifestyle Modification

Modification	Approximate SBP reduction
DASH eating plan	8–14 mmHg
Sodium reduction	2–8 mmHg
Weight reduction	5–20 mmHg/10 kg weight loss
Physical activity	4–9 mmHg
Moderation of alcohol	2–4 mmHg



Hypertension Control Summary

- Lifestyle plays a very important role in control of blood pressure
- YOU have the power to prevent disease



Status of the ABCS

A spirin	People at increased risk of cardiovascular disease who are taking aspirin	47%
B lood pressure	People with hypertension who have adequately controlled blood pressure	46%
C holesterol	People with high cholesterol who have adequately managed hyperlipidemia	33%
S moking	People trying to quit smoking who get help	23%

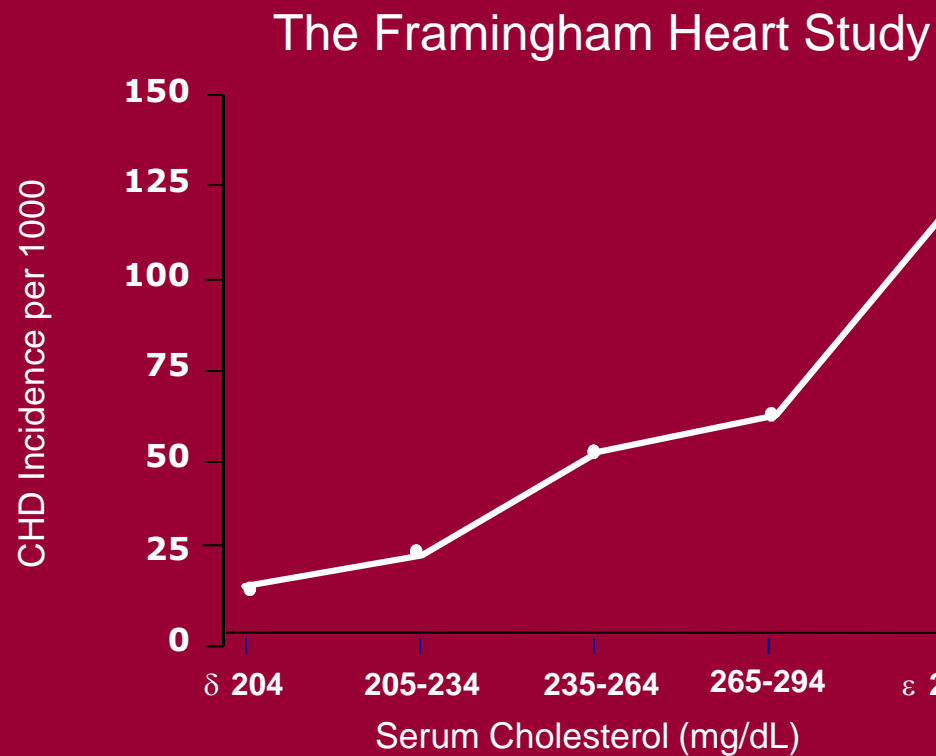
Source: *MMWR: Million Hearts: Strategies to Reduce the Prevalence of Leading Cardiovascular Disease Risk Factors --- United States, 2011, Early Release, Vol. 60*



List of Variables	Nationwide * (States and DC)	Kentucky	
	Median %	%	95% CI
Cholesterol Awareness			
Adults who had their blood cholesterol checked in past 5 years	75.5	75.7	74.2 - 77.2
Adults with high blood cholesterol	38.4	41.3	39.8 - 42.9
Diabetes			



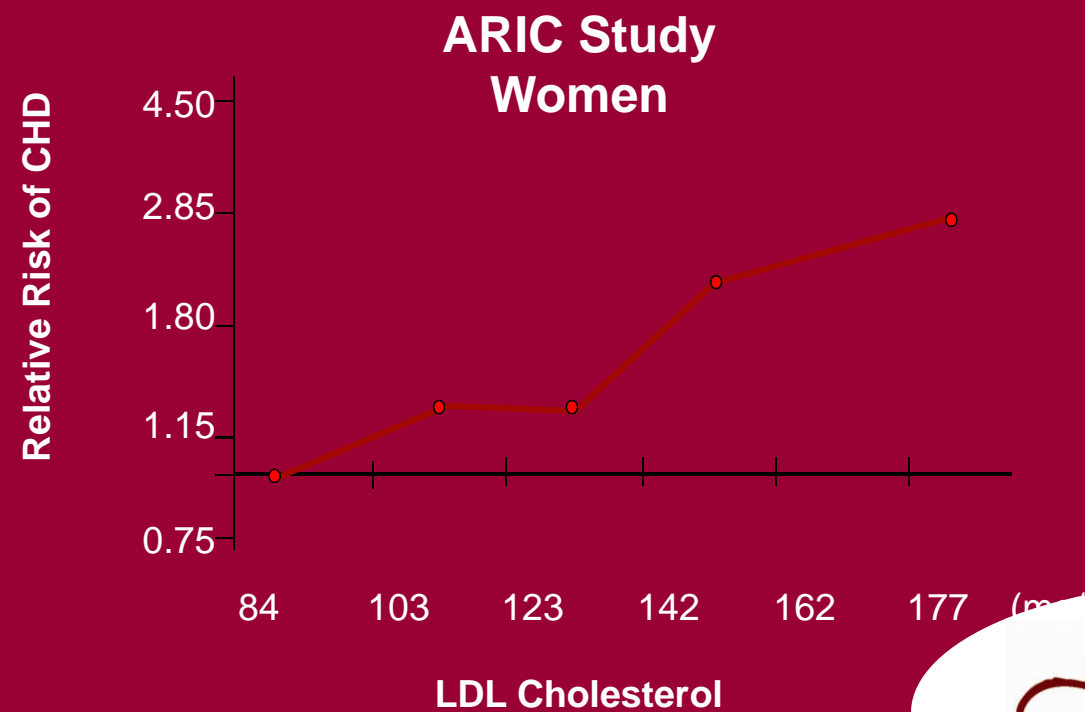
Increasing Cholesterol = Increasing Risk



Castelli W, Am Heart J, 1984



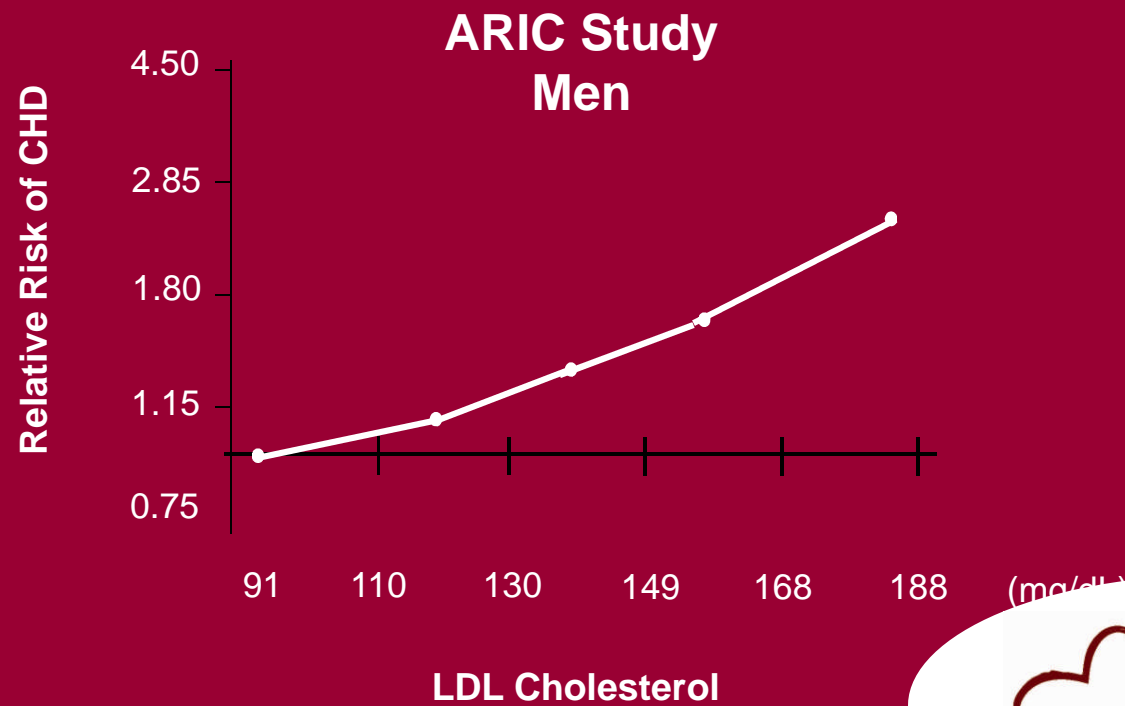
Increasing Cholesterol = Increasing Risk



Sharrett AR, Circulation, 2001



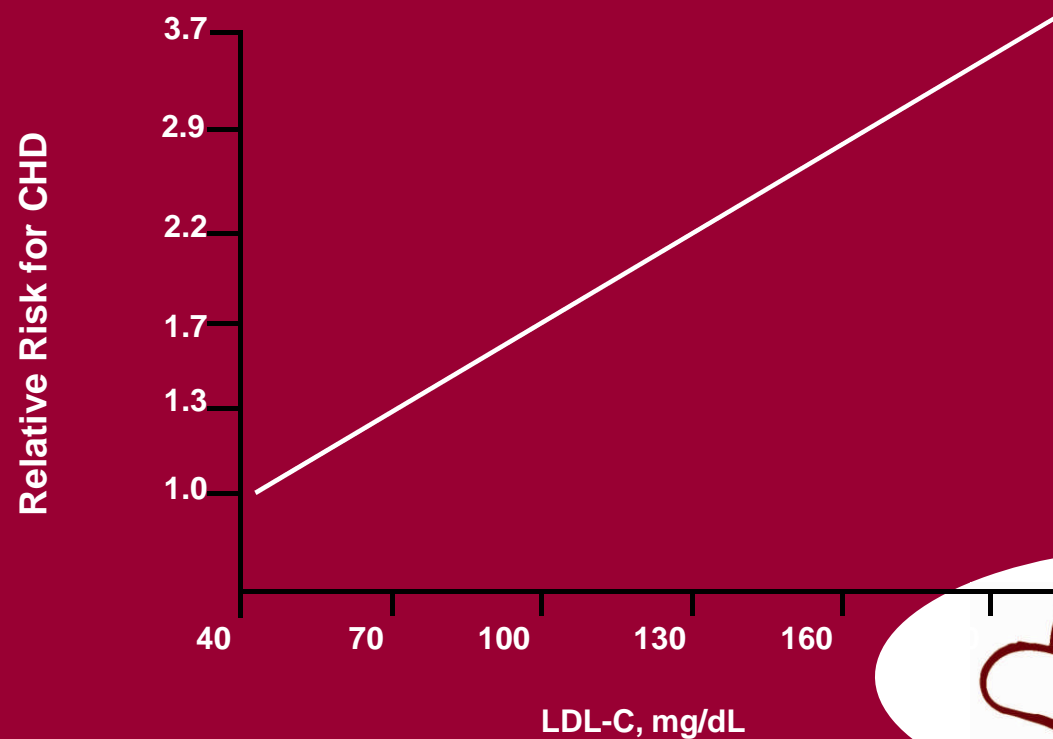
Increasing Cholesterol = Increasing Risk



Sharrett AR, Circulation, 2001



Increasing Cholesterol = Increasing Risk



Grundy SM, Circulation, 2004



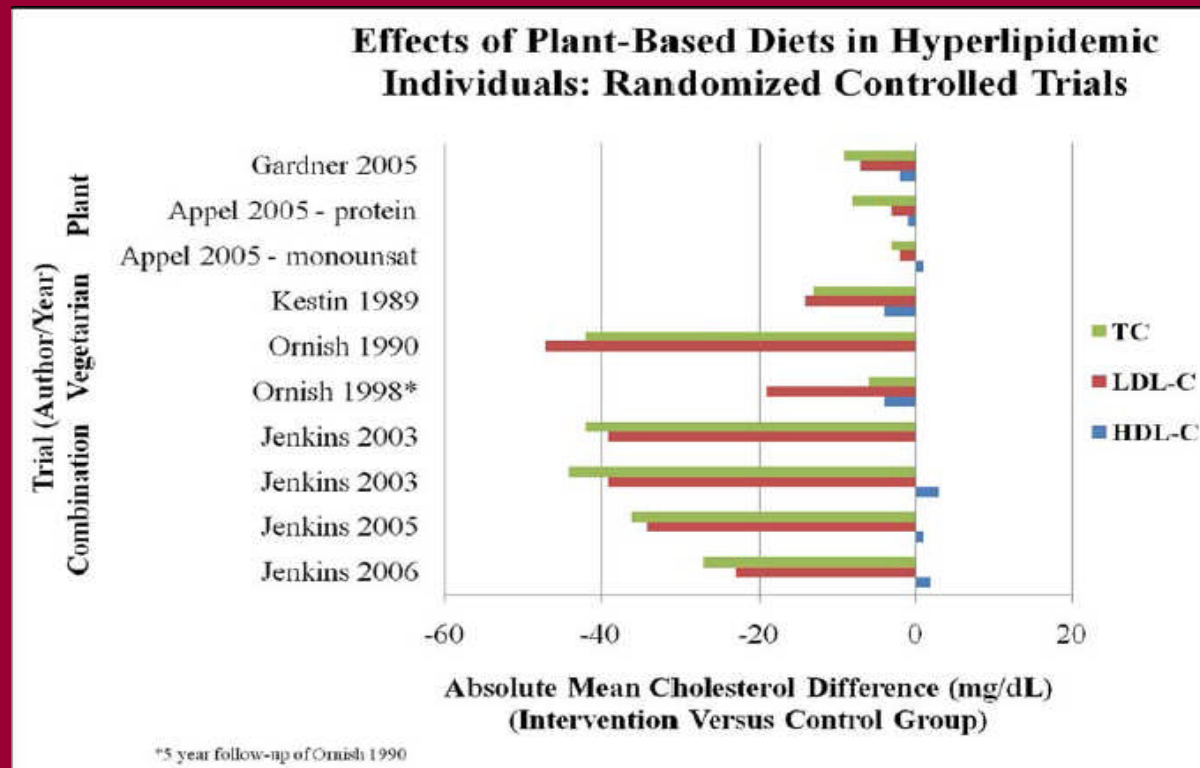
HDL

- * *Optimal*

- ◆ >40 mg/dL in men
- ◆ >50 mg/dL in women

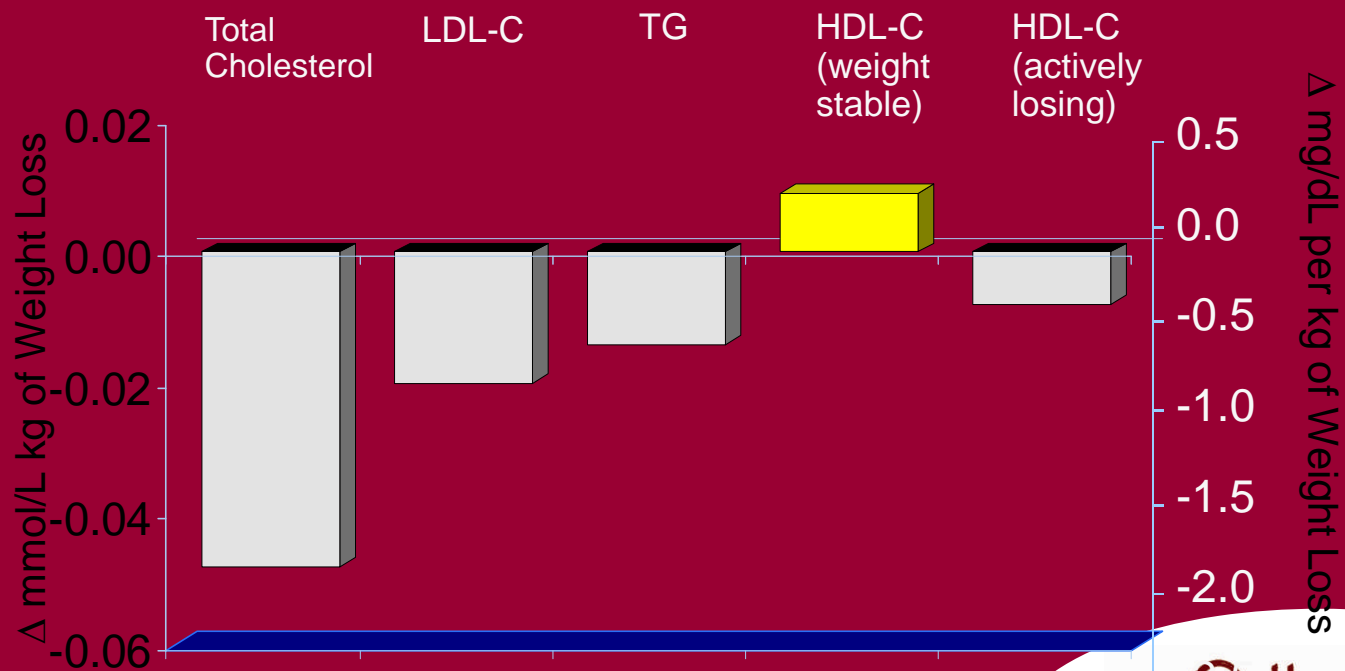


Plant-Based Diets Lower Cholesterol



llion
hearts™

Plasma Lipids Improve with Weight Loss



Dattilo et al. *Am J Clin Nutr* 1992

Benefits of Exercise

- ↑ HDL levels 4.6%
- ↓ Triglycerides 3.7%
- ↓ LDL 5.0%

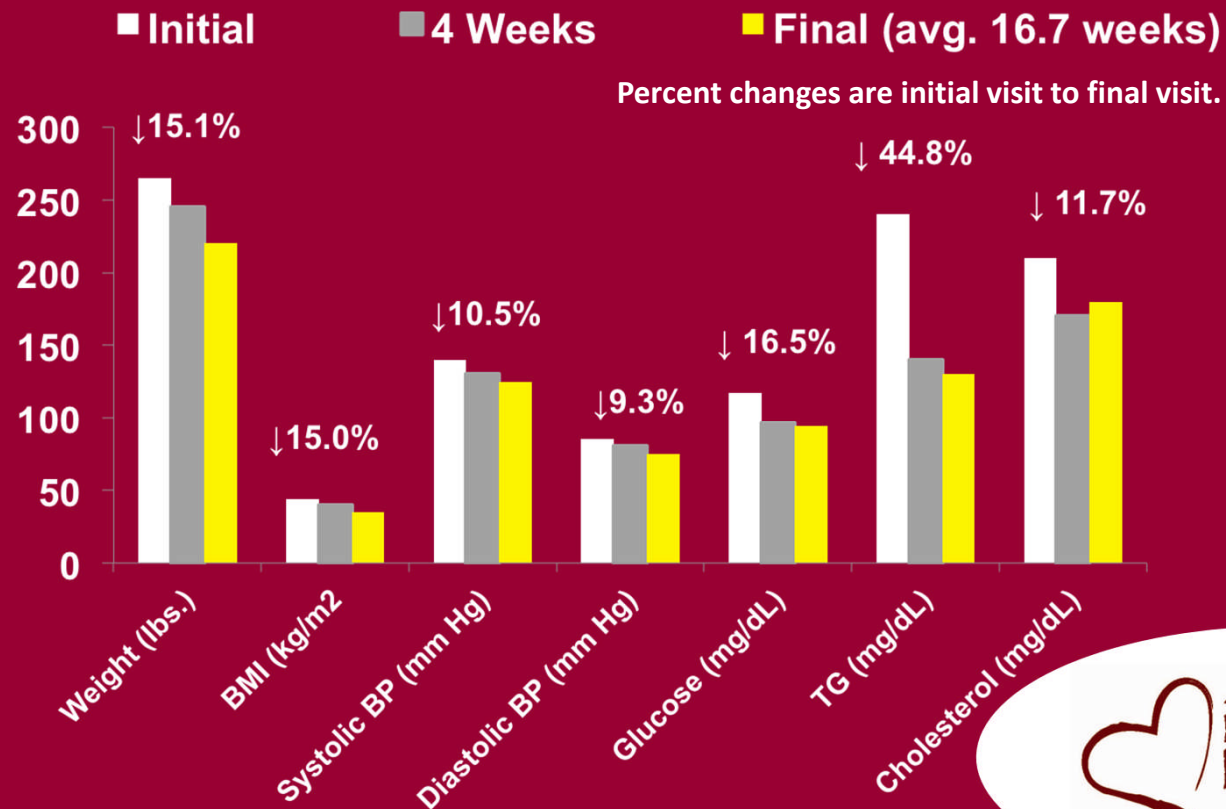
- ↓ SBP 7.4 mmHg
- ↓ DBP 5.8 mmHg

- ↓ HgA1c 0.5% to 1%,



Thompson PD. *Arteriosclerosis, thrombosis and vascular biology*, 2003.

Weight Loss & Cardiometabolic Risk Factors



Case CC. *Diabetes Obes Metab.* 2002;4:407-414.



Status of the ABCS

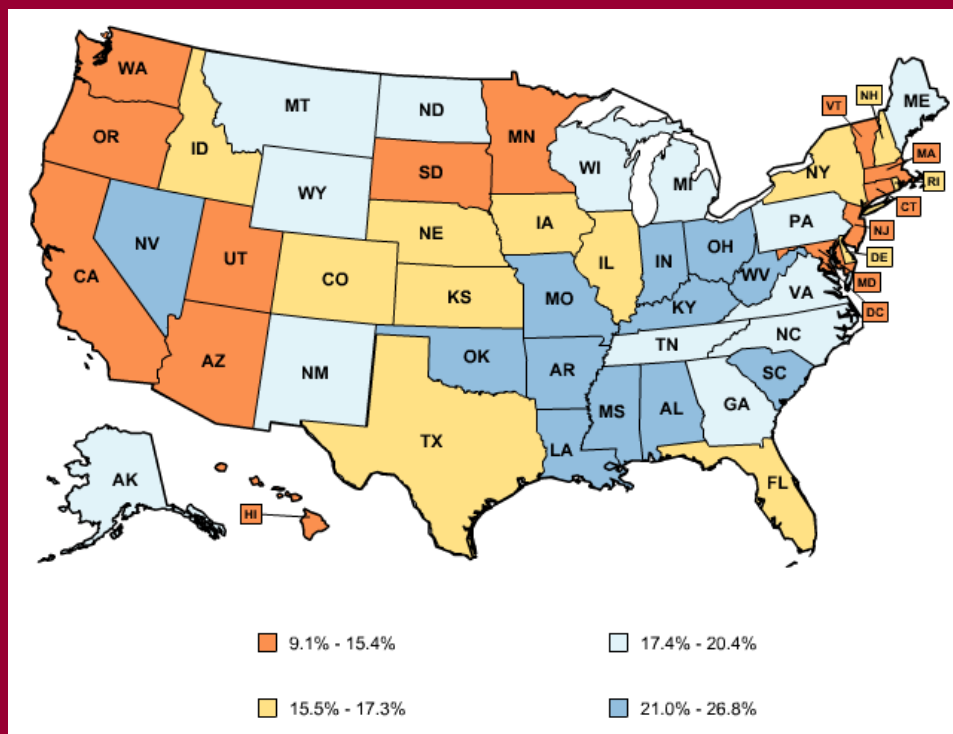
A spirin	People at increased risk of cardiovascular disease who are taking aspirin	47%
B lood pressure	People with hypertension who have adequately controlled blood pressure	46%
C holesterol	People with high cholesterol who have adequately managed hyperlipidemia	33%
S moking	People trying to quit smoking who get help	23%

Source: *MMWR: Million Hearts: Strategies to Reduce the Prevalence of Leading Cardiovascular Disease Risk Factors --- United States, 2011, Early Release, Vol. 60*



Smoking Prevalence

KY 24.8% (#2) US 17.2%





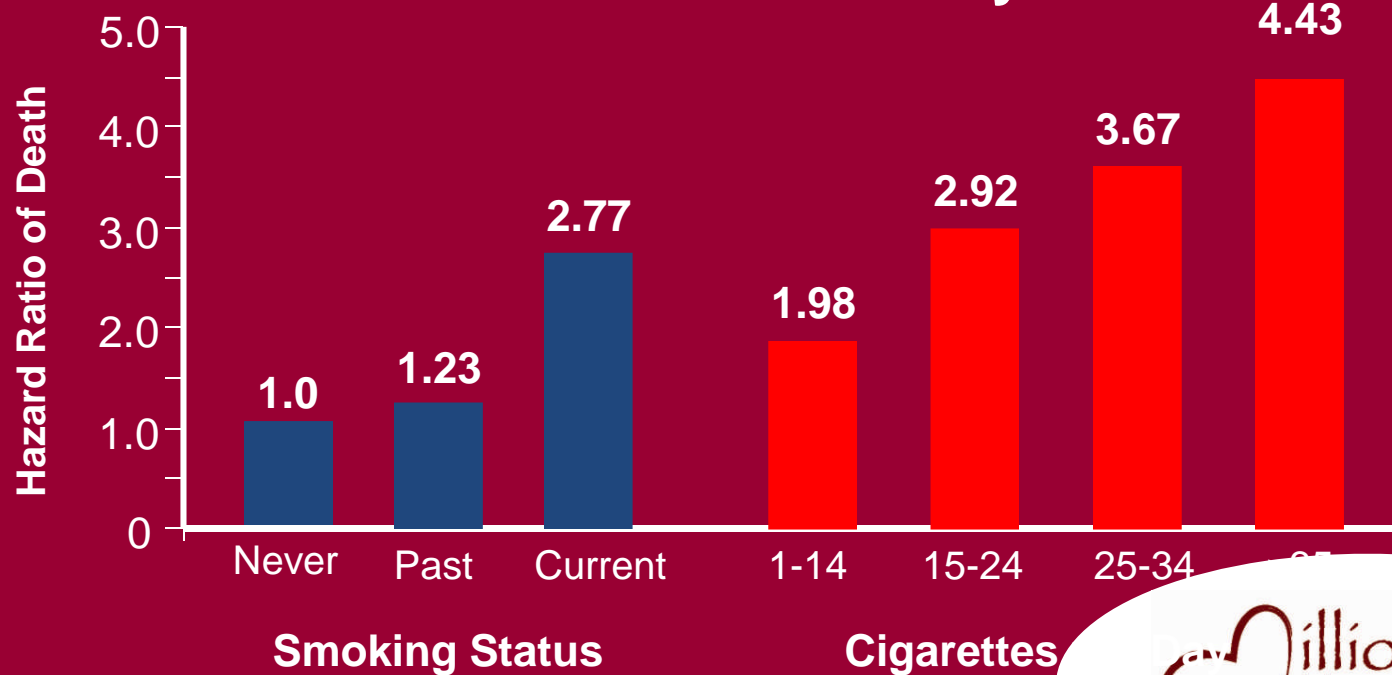
Smoking Mortality

- Death Rate Attributable to smoking (2004)
 - **Kentucky leads the nation at 371 deaths per 100,000 or 7,700 deaths annually**
 - **US: 263 deaths per 100,000**
 - **Utah: 138 deaths per 100,000**



Mortality & Smoking

Nurses Health Study



Kenfield SA, JAMA, 2008

Key Components of Million Hearts™

- **Community Prevention**
 - Reduce the number of people who need treatment
- **Clinical Prevention**
 - Optimize care for those who do



Clinical Prevention

Optimizing Care for Those who Need it

- Focus on the ABCS and align with incentives
 - Aspirin
 - Blood pressure
 - Cholesterol
 - Smoking
- Innovate in Care Delivery to improve adherence and control of ABCS



Medical System Messages

- **Clinicians**

- Emphasize power of prevention; create systems to get an “A” in the ABCS; use decision supports and registries to drive performance; deploy teams

- **Pharmacists**

- Monitor and influence refill patterns; team up; teach adherence!



Medical System Messages

- **Insurers**

- Measure and incentivize performance on the ABCS; collect and share data for quality improvement; empower consumers

- **Individuals**

- Know your numbers—and goals
- Take aspirin, if advised
- Get aggressive with BP and Cholesterol
- Cut sodium and trans-fats
- If you smoke, quit



Million Hearts™ Outcomes

- 10M more people with HBP controlled
- 20M more people with high cholesterol optimized
- 4M fewer people will smoke
- 20% drop in average sodium intake
- 50% drop in average trans fat intake



Million Hearts™ Initiatives in Kentucky

- Kentucky Million Hearts™ Collaborative
 - KY ACC
 - AHA Great Rivers Affiliate
 - Health Care Excel—the Kentucky Medicare Quality Improvement Organization
 - Kentucky Department for Public Health



Million Hearts™ Initiatives in Kentucky

www.stelizabeth.com/services/kycare

[illegible]

**IS IT A STROKE?
CHECK THESE SIGNS **FAST****



FACE Does the **FACE** look uneven? Ask them to smile.

ARM Does one **ARM** drift down? Ask them to raise both arms.



SPEECH Does their **SPEECH** sound strange? Ask them to repeat a phrase



TIME EVERY second
brain cells die. Call **9-1-1**
at **ANY** sign of a stroke!

STROKE IS AN EMERGENCY!

Call 911 **immediately** if you see
or have any of these symptoms.
Every minute counts!

**BLOOD
PRESSURE
RECORD FOR**

Kentucky Heart Disease and Stroke Prevention Task Force

In partnership with:
CARE Collaborative
www.stefizabern.com/services/nkycare



Million Hearts™ Initiatives in Kentucky

www.stelizabeth.com/services/kycare

CONGRATULATIONS!

If your blood pressure falls in this category, you are in the normal range for blood pressure control. Your goal is to keep your blood pressure at this level. Some ways you can help to stay in this range are:

- ♥ Stay at a healthy weight.
- ♥ Limit salt in your diet.
- ♥ Limit how much alcohol you drink.
- ♥ Get regular physical activity.
- ♥ Have routine blood pressure monitoring.
- ♥ Don't smoke.

Talk to your health care provider about other ways to keep your blood pressure "in the green."

CAUTION!

If your blood pressure falls in this category, you are in the "borderline" range for high blood pressure, also known as "prehypertension." Persons with prehypertension are very likely to develop high blood pressure in the future. Take steps now to lower your blood pressure.

Some ways to help lower your blood pressure are:

- ♥ Lose excess body weight.
- ♥ Limit salt in your diet.
- ♥ Limit how much alcohol you drink.
- ♥ Increase physical activity.
- ♥ Don't smoke.

**KY Tobacco Quit Line: 1 (800) QUIT-NOW
1 (800) 784-8669**

Talk to your doctor about other ways to help lower your blood pressure.

WARNING!

If your blood pressure falls in this category, it is high. Ongoing high blood pressure or "hypertension" is a serious medical condition that can lead to strokes, heart attacks and other major health problems, even if you feel well.

Talk to your doctor right away about ways to lower your blood pressure.

Call 911 or go to an emergency room **IMMEDIATELY** if you have any signs or symptoms of stroke such as those listed on the back of this card.



In summary:

Million Hearts[™] aims to bridge the gap between public health and clinical practice through:

- ✓ Effective public policy, clinical quality measurement, and
- ✓ The implementation of a wide breadth of practice-based interventions including improvements in control of the ABCS



Join Us: Take the Pledge



<http://millionhearts.hhs.gov>

Alison.bailey@uky.edu

